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EXAMINER	
FERRIS III, FRED O	

ART UNIT	PAPER NUMBER
2128	

DATE MAILED: 11/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/849,010	KLEVANS, RICHARD L.	
	Examiner	Art Unit	
	Fred Ferris	2128	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 May 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-13* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-13* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *23 June 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *(10) 10/23-8/28*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-13 have been presented for examination based on applicant's disclosure filed on 4 May 2001. Claims 1-13 have been rejected by the examiner.

Priority

2. Applicant's claim for priority based on Provisional application number 60/202,190 filed on 5 May 2000 is acknowledged.

Drawings

3. Applicant's formal drawings filed on 23 June 2003 have been approved by the examiner.

Claim Interpretation

4. Applicants are claiming limitations relating to a system and means for a network simulator, defining a network functionality, redirecting network communications, simulating network hardware, simulating network functionality, and generating simulated network hardware/software responses in a network simulation system that includes a simulator library and user interface. The examiner notes that these features are generally inherently provided by commercially available network simulators such as OPNET Modeler, BONeS, and COMNET since these products provide modeling and manipulation of simulated network transmission paths and network components so that

system performance and software functions can be tested prior to actual system implementation and equipment purchase. (See: Chang Section 1.0, for example)

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 1-13 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Specifically, independent claims 1 and 9 include limitations relating to a network simulation system including a network simulator that has not been sufficiently described in the specification. While the specification makes reference to the network simulator communicating with the software emulators, and simulating the communications between simulated devices on the simulated network (page 10, line 24 to page 11, line7), it provides no algorithms, techniques, or flow charts describing specifically how the claimed simulated network is actually implemented by the network simulation system. The block diagram disclosed in Figure 3 does not cure this deficiently. Further, the network simulator "example" text beginning on line 3 of page 11 appears to merely be directed to the manipulation of read/write registers during interrupt servicing. These

passages are confusing since they do not give any indication how the interrupt process relates to the operation of the network simulator. Also, merely stating the network simulator runs a "simulation of events of all nodes in the network" (page 11, line 13) does not sufficiently disclose how the operation of the claimed network simulator is realized. Accordingly, one skilled in the art would not know how to make and/or use the claimed network simulator from the description contained in the specification without undue experimentation. Dependent claims inherit this defect.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claims 1-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over "Network Simulations with OPNET", X. Chang, Proceedings of 1999 Winter

Simulation Conference, IEEE 1999 in view of U.S. Patent 6,571,356 issued to Mehr et al.

Independent claims 1 and 9 are drawn to the following limitations:

> *system and means for simulating hardware on which software is to be tested comprising:*
>
> *- **hardware interface** intercepting/redirecting communications between software and hardware and returning responses to software;*
>
> *- **network simulation system** in communication with hardware interface providing simulated hardware and generating responses to software;*
>
> *- **user interface** for entering commands for creating simulated network, defining topology of said simulated network, and invoking simulated network, user interface in communication with network simulation system;*
>
> *network simulation system includes:*
> *- **network simulator** for simulating functionality of simulated network and in communication with hardware interface*
>
> *- **simulator library** providing application programmers interface for creating simulated network defining functionality of network and in communication with network simulator and user interface.*

Regarding independent claim 1: Chang discloses the commercially available OPNET Modeler network simulator and modeling tool used for the development and analysis of communications networks. (pp. 308, Section 2.0, pp. 309, Section 2.1.1) Chang further discloses the OPTNET Modeler operating as a network simulation system providing simulated hardware running on standard workstations with graphical capabilities (pp. 308, paragraph 2, Section 2.0, pp. 311, Section 3.0, Figs. 1-3, 8-10). The OPNET Modeler provides a GUI based user interface for developing a simulated network model including a Network Editor, Node Editor, Process Editor, Simulation &

Debugging tool, Probe editor, Analysis tool, Filter tool, Animation tool, and a Model Library that includes models for popular network architectures (fiber optic, LAN, Ethernet, x.25, etc.) and models for popular vendor network hardware (routers, amplifiers, etc.). OPNET Modeler therefore allows the user to fully define and simulate the functionality of a simulated network and related components. (See: OPNET Modeler product brochure, Mil 3 Inc., 1999, Model Library, Standard Models)

Chang discloses the elements of the claimed limitations of the present invention as follows:

- ***user interface*** *for entering commands for creating simulated network, defining topology of said simulated network, and invoking simulated network, user Interface in communication with network simulation system: Chang discloses a user interface for setting up network performance criteria values (power, s/n ratio, etc.) using OPNET's Network Model and Simulation Editor. (page 309, Section 2.1.1, 2.2.1) Chang further discloses OPNET's Node Editor for creating and modeling components (modules) that make up the optical network. (page 309, sections 2.1.1 and 2.1.2) OPNET's Model Library includes models for popular vendor hardware component (devices) modules and allows the user to fully define and simulate the functionality of a simulated network and related components. (See: OPNET Modeler product brochure, Mil 3 Inc., 1999, Standard Models, Vendor Device Models)*
- ***network simulator*** *for simulating functionality of simulated network and in communication with hardware interface: The OPNET Modeler provides a GUI based*

user interface for developing a simulated network model including a Network Editor, Node Editor, Process Editor, Simulation & Debugging tool, Probe editor, Analysis tool, Filter tool, Animation tool, and a Model Library that includes models for popular network architectures (fiber optic, LAN, Ethernet, x.25, etc.) and models for popular vendor network hardware (routers, amplifiers, etc.) for simulating the functionality of network components. (Chang: pp. 308, paragraph 2, Section 2.0, pp. 311, Section 3.0, Figs. 1-3, 8-10, also see: OPNET Modeler product brochure, Mil 3 Inc., 1999, Model Library, Standard Models)

- ***simulator library*** *providing application programmers interface for creating simulated network defining functionality of network and in communication with network simulator and user interface: The OPNET Model (simulator) disclosed by Chang includes a model library includes for popular network architectures (fiber optic, LAN, Ethernet, x.25, etc.) and models for popular vendor network hardware elements (routers, amplifiers, etc.). (Chang: pp. 309, sections 2.1.1 - 2.1.3, also see: OPNET Modeler product brochure, Mil 3 Inc., 1999, Standard Models)*

Chang does not explicitly disclose a hardware interface intercepting/redirecting communications.

Mehr discloses a hardware interface used in network simulation having component ports for carrying out various emulator programming and data transfer tasks and communicating with software application links. (Abstract, CL2-L3-25, Figs. 1, 2)

Mehr discloses the elements of the claimed limitations of the present invention as follows:

- hardware interface intercepting/redirecting communications between software and hardware and returning responses to software: Mehr discloses a hardware interface for performing data transfer tasks and communicating with software application links. The hardware interface further includes a network interface (CL2-L20, Figs. 1) and data router (Fig. 2, block 34) for intercepting and redirecting communications between hardware and software processes. (CL4-L1-7, CL6-L2)

*It would have been obvious to one having ordinary skill in the art at the time the claimed invention was made to modify the teachings of Chang relating to the use of OPNET Modeler network simulator and modeling tool, with the teachings of Mehr relating to a hardware interface used in network simulation (emulation) for data transfer tasks and communicating with software application links, to realize the claimed **network simulation system** including the hardware interface and simulated hardware for generating responses to software. An obvious motivation exists since, in this case, the Chang reference teaches to the Mehr reference, and the Mehr reference teaches to the Chang reference. Specifically, both Chang and Mehr teach network simulation and are used in the same technical arena as noted above. Chang teaches to Mehr because Chang discloses the simulation of various network hardware components in communication with simulated network components (See: Chang Section 2.0-2.2.1)). Mehr teaches to Chang because Mehr specifically discloses the use of emulated*

(simulated) hardware communicating with software applications over a network. (See: Mehr CL2-L3-25, CL4-L1-7) Further, the level of skill required by an artisan to realize the claimed limitations of the present invention is clearly established by both references. (See: Chang/Mehr, Abstract/Background) Accordingly, a skilled artisan having access to the teachings of Chang and Mehr, would have knowingly modified the teachings of Chang with the teachings of Mehr (or visa versa) to realize the claimed elements of the present invention.

Per dependent claim 2: Mehr discloses access (communication) via a proxy (emulated) stub for obtaining emulator programming information. (CL6-L2-11) Chang discloses simulated network communication with simulated node elements which include popular vendor hardware elements (routers, stubs, etc.) from the model library as noted above. (See: OPNET Modeler product brochure, Mil 3 Inc., 1999, Standard Models, Vendor Device Models) Chang further discloses functions of a topology manager via the Network editor and Node editor that allow the user to create a simulated network topology. (pp. 309, Sections 2.1-2.2.1, Figs. 8-10) Chang also discloses the functions of an event handler via the Simulation editor that allows the user to direct and manage the simulation of network events. (pp.309, Section 2.2.1) Both Mehr and Chang disclose simulated (emulated) hardware elements as noted above. The various editors disclosed by Chang (i.e. network, node, process and parameter editors) intercommunicate with each other and allow the user to input commands and return and display the responses from simulation execution (page 309, Sections 2.1.1-2.3.2, Figs. 1, 2).

Per dependent claims 3 and 8: Chang discloses the simulation of all network components including the end station (end-to-end) modeling of network components from the model library. (pp. 311, section 3.0, Figs. 3, 4, 8)

Per dependent claim 4: As noted above, Mehr discloses access (communication) via a proxy (emulated) stub for obtaining emulator programming information (CL6-L2-11) while Chang discloses simulated network communication with simulated node elements which include popular vendor hardware elements (routers, stubs, etc.) from the model library. Mehr also discloses a hardware interface used in network simulation (emulation) for data transfer tasks and communicating with software application links as previously noted above. (CL2-L3-25, CL4-L1-7)

Per dependent claim 5: The hardware interface disclosed by Mehr facilitates communications and data transfers with software applications as noted above. The interface includes a microprocessor based control function (controller) for network communication (CL2-L15-25).

Per dependent claim 6: As noted above, Chang and Mehr render obvious the claimed limitations relating to a simulated network, defining network functionality, redirecting communications, simulating hardware, simulating network functionality, and generating simulated network hardware/software responses. (Chang: Sections 2.0-2.3.2, Mehr: CL2-L3-25, CL4-L1-7) As further noted above, the intended use of Network simulators such as OPNET, if for the purpose modeling and testing of simulated network transmission paths and network components so that system performance and software functions can be tested prior to system implementation and

equipment purchase. Hence, one skilled in the art would have knowingly modified the teachings of Chang with teachings of Mehr (or visa versa) to realize the claimed method for simulating hardware on which software is to be tested using the reasoning previously cited above.

Per dependent claim 7: Chang discloses a topology manager via the Network editor and Node editor that allow the user to create a simulated network topology consisting of node and links. (pp. 309, Sections 2.1-2.2.1, Figs. 8-10) Chang also discloses the functions of an event handler via the Simulation editor that allows the user to direct communication and manage the simulation of network events. (pp.309, Section 2.2.1)

Per claims 9-13: This group of claims merely claims the "means for" the same limitations recited in system claims 1-5 respectively. These claims are therefore rejected using the same reasoning as previously recited for claims 1-5 since the prior art clearly discloses the necessary "means for" the claimed limitations as noted in the previous rejection of claims 1-5.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Careful consideration should be given prior to applicant's response to this Office Action.

U.S. Patent 6,366,875 issued to Colizzi et al teaches a network simulator and hardware interface.

U.S. Patent 5,881,267 issued to Dearth et al teaches a network simulator and hardware interface and virtual bus stubs.

"Modeling and Simulating Congestion Control in Wide-Area TCP Networks using BONeS", M. Gream, Thesis Presentation, 1995 teaches the BONeS network simualtor.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Fred Ferris whose telephone number is 571-272-3778 and whose normal working hours are 8:30am to 5:00pm Monday to Friday. Any inquiry of a general nature relating to the status of this application should be directed to the group receptionist whose telephone number is 571-272-3700. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jean Homere can be reached at 571-272-3780.

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